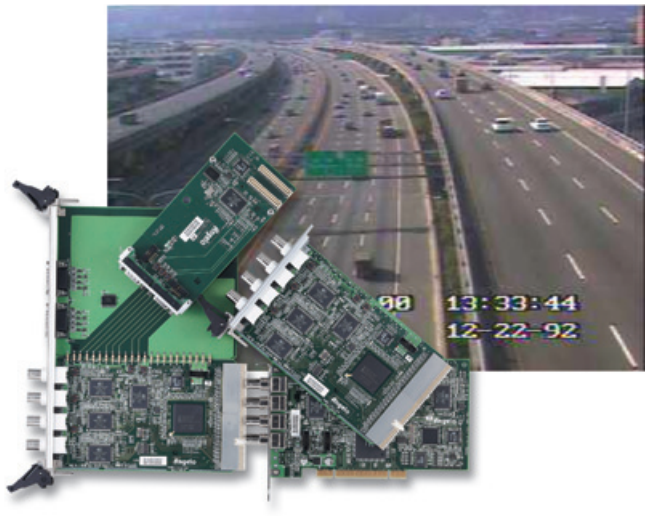
Video Surveillance Application Solutions

Overview

ADLINK's Angelo series of serial frame grabbers provides a solution for high performance video surveillance applications with the best performance to cost ratio for standard video input in color (PAL/NTSC) or in monochrome format (CCIR/EIA). Its design is ideal digital video recorders (DVR), intelligent transportation systems (ITS), remote building surveillance systems, and parking lot management systems. All Angelo products are FCC and CE certified.

The Angelo RTV series provides 4 channels of real-time video acquisition and includes PMC, CompactPCI, and PCI bus models. The PCI-MPG24 is ideal for surveillance applications with included hardware MPEG4 video compression.



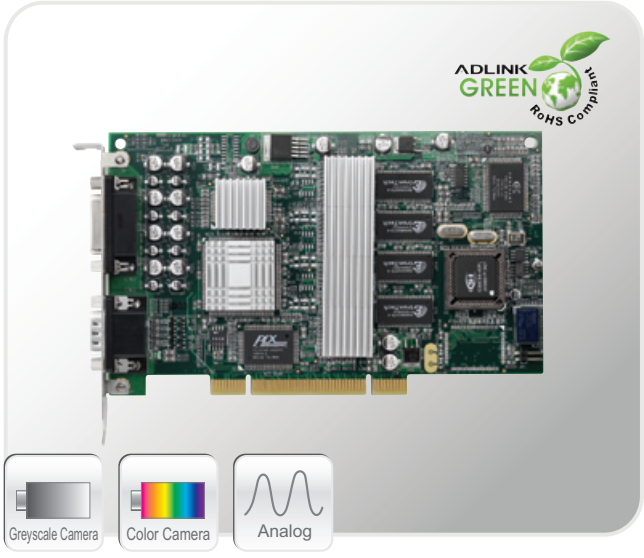
Frame Grabber Selection Guide

Model Name	PMC-RTV21	cRTV-24	cRTV-44	RTV-24	PCI-MPG24
Video Input Standard	Color (PAL/NTSC), Monochrome (CCIR/EIA (RS-170)				
Resolution	640 x 480 (NTSC/EIA (RS-170), 768 x 576 (PAL/CCIR))				**Full D1
Max. Video Input	1 - 4	4	4	4 - 16*	4
Form Factor	PMC	3U cPCI	6U cPCI	PCI	PCI
Sampling Rate	33MHz	Up to 66MHz		33MHz	
Max. Frame Rate	30fps	120fps			
Connector Interface	DB9	BNC x 4			
Real-Time Video Capture	Yes				
Software MPEG4 Video Encoding	No				No
Hardware MPEG4 Video Encoding	No				Yes
MPEG4 Video Decoding	No			Yes	
Windows Driver	Windows 98/NT/2000/XP/XPe				Windows 2000/XP/XPe
Linux Driver	Yes				Yes
LabVIEW Driver	Yes, AngeloLVIEW				No
Microsoft Directx 8.0 above	Yes				Yes
Page No.	1-8	7-11	7-11	3-2	3-1

* RTV-E4 four channels extension board optional
** Full D1: 720 x 480 (NTSC), 720 x 576 (PAL)

Angelo PCI-MPG24

4 Channels MPEG4 Hardware Real-Time Video Compression Card



Features

- 4-Channel MPEG4 hardware video encoder
- Real-time Full D1* video encoding up to 120fps
- Supports real-time video raw data preview
- On-board 64MB SDRAM memory buffer
- On-board TTL I/O lines
- Build-in watchdog timer
- Security protection circuit
- Supports Microsoft® DirectX®

Applications

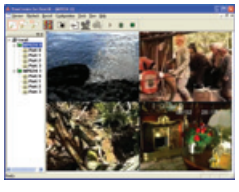
- Digital Video Recorder (DVR)
- Intelligent Traffic Monitoring Systems
- Remote Surveillance Systems
- Factory Monitoring Systems

Software Support

- Microsoft® DirectX®
- Microsoft® Visual Studio .net®, Visual C++® and C++ Builder
- Microsoft® Windows 2000/XP/XPe
- Sample programs included
- Linux driver: Red Hat 9.0 at Kernel 2.4.23

ViewCreator for DirectX Utility

ViewCreator helps developers to quickly evaluate initial tests and functions.



Ordering Information

PCI-MPG24	4-CH MPEG4 Hardware Real-Time Video Compression Card

Introduction

The PCI-MPG24 is a MPEG4 hardware video compression card that provides 4 channels of real-time Full D1 MEGP4 video encoding and decoding with a preview function for digital video surveillance applications. This 32-bit, 33MHz PCI bus frame grabber simultaneously captures and encodes four video analog streams in real time. It accepts standard composite color (PAL, NTSC) or monochrome video formats (CCIR, EIA) cameras inputs. Each PCI-MPG24 card has a unique hardware ID number. System integrators can design protections to lock their system product. System integrators will benefit from a watchdog timer (for fault-tolerant applications) and easy-to-use standard connectors.*

Real-time Video Encoding

Supports real-time Full D1, quarter or downscale video size encoding. Full D1* video format:*

- *NTSC (720 x 480) at 30fps per channel, 4-CH total up to 120fps*
- *PAL (720 x 576) at 25fps per channel, 4-CH total up to 100fps*

Adjustable Video Quality

Bit and frame rates are adjustable to fit variable bandwidths, as seen in remote Internet applications.
I, IP, IBP, and IBBP GOP structures are programmable for enhanced video quality.

Real-time Raw Data Preview

- ***Single channel:** real-time preview at VGA resolution.*
- ***4 channels:** simultaneously real-time preview at quad resolution.*

Video Decoding

Enhanced software decodes video for playback or remote client monitoring. The PCI-MPG24 card is not needed for playback.

Video Saving

The PCI-MPG24 saves video in the AVI video file format. Users can playback AVI file by Microsoft® Windows® Media Player®.

I/O Lines

TTL compatible I/O lines are provided, supporting 4 inputs, 4 outputs, and one +5V output for device control.

Watchdog Timer

A hardware watchdog is available on the Angelo PCI-MPG24. The watchdog is able to monitor the PC's application operation and will automatically reset the PC after a programmable inactivity time-out. This ensures a reliable operation of remote systems.

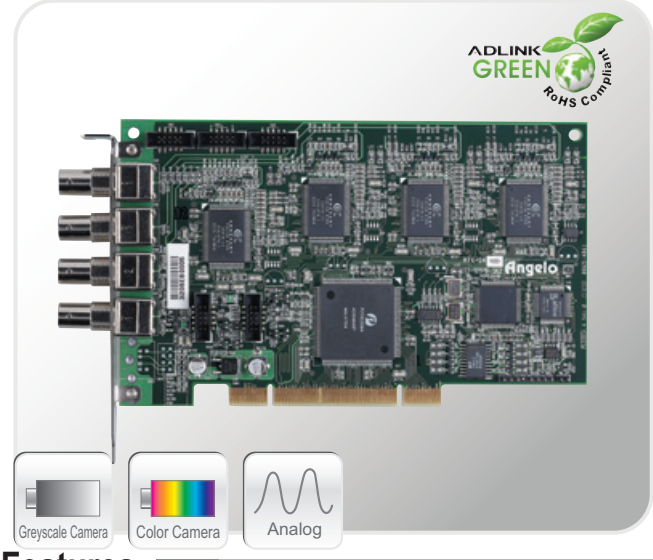
Minimum System Requirements

- ***Platform:** Pentium III, 850MHz CPU, and 512MB SDRAM or above.*
- ***VGA display:** AGP 4X above (Not recommended VIA or SiS VGA Chipset solution).*
- ***Display setting:** 800 x 600 above resolution, 16-bit above color format.*
- ***OS:** Windows 2000 Professional with SP4 or Windows XP Professional with SP1*
- ***Software requirement:***
  For end users: Microsoft DirectX 9.0 End-User Runtime
  For developers: Microsoft DirectX 9.0 SDK
  DivX Video Decoder (Optional)

As software decoding consumes system resources, a system platform upgrade must be made for system decoding.

Angelo RTV-24

4 Channels Real-time Video Capture Board for Standard Cameras



Features

- Four color video digitizers operating in parallel
- Up to 120fps in 32-bit, 33MHz/66MHz PCI bus
- Color (PAL / NTSC), monochrome (CCIR / EIA) camera
- Up to 16 channels extension
- On-board TTL I/O lines
- Built-in watchdog timer
- Protection circuit for security issue
- User Friendly ViewCreator utility
- Software trigger supported

Applications

- PC Based Surveillance System
- Digital Video Recorder (DVR)
- Factory Monitoring System
- Machine Vision Inspection System
- Scientific Research Instrumentation
- Medical Research Instrumentation

Software Support

WDM driver

The driver's supports VC++/VB/C++ Builder/Delphi programming under Windows 98/NT/2000/XP/XPe platforms with DLL.

LabVIEW driver

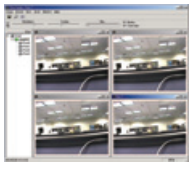
Angelo-LVIEW

Linux driver

Red Hat 7.3, kernel 2.4.18 above

ViewCreator

ViewCreator assists developers to evaluate initial tests and functions.



Ordering Information

Angelo RTV-24	4-Channel real-time video capture board for standard cameras

Introduction

General

The Angelo RTV-24 acquisition board is designed without compromise for security and video surveillance applications. It's the ideal device for PC based multiple-channel digital video recording.
This 32-bit, 33MHz/66MHz PCI bus frame grabber can capture simultaneously four analog video streams in real time. It accepts standard composite colors (PAL, NTSC) or monochrome video formats (CCIR, EIA).

The resolution is programmable including square-pixel (640 x 480 or 768 x 576) and broadcast resolution. Before captured images are transferred to the PC's memory, images can be scaled down using available selectable ratios.

Arbitrary cropping to regions of interest is possible. The RTV-24 generates bitmaps in all popular color formats such as RGB, YUV, planar or packed.

System integrators also benefit from a watchdog for fault-tolerant applications and easy-to-use standard connectors.

Image Acquisition

Frame Rate: *30 full-frame images acquired per second for each channel.*

Color Image: *Color video format is compatible with the following composite video input formats: NTSC-M, NTSC-Japan, PCL-B, PAL-D, PAL-G, PAL-H, PAL-I, PAM-M, PAL-N and SECAM*

Monochrome Image: *The monochrome video acquisition is compatible with CCIR and EIA (RS-170).*

Optional Scaling: *The acquire images or portions of images can be optionally scaled:*

- *Acquisition of a programmable area of interest.*
- *Scaling of the image. (down to 1:16)*
- *Adjustment of hue (for NTSC signals), contrast (0 to 200%), brightness and saturation. (0 to 200% for U and V signals)*
- *Automatic chrominance gain control.*

RTV-E4 Extension Board (Optional)

- *Channel Extension*
  - *Expandable up to 16 channels.*
  - *Channel extension interface.*
    - *10-pin ribbon cable to onboard 10-pin header connector for channel extension. Each header*
    - *adds 4 video input channels. Three 10-pin header connectors onboard.*

I/O Lines

The Angelo RTV-24 is fitted with TTL compatible I/O lines, supporting 4 inputs, 4 outputs and 4 soft trigger lines with protection against overloads and electrostatic discharges.
Every line maybe configured as an input or output or can be used to trigger an acquisition or report an alarm condition.

RTV-I4 Isolated GPIO Board (Optional)

- *General Purpose I/O Lines.*
  - *All I/Os are TTL compatible and support 4 inputs, 4 outputs, and 4 soft trigger lines.*
  - *I/O interface.*
    - *Two onboard 10-pin header connectors.*
    - *The I/O lines are pulled high internally and have the following characteristics:*

Voltage	Min.	Max.
Input High Voltage (20μA)	2.0V	5.25V
Input Low Voltage (-0.2μA)	0.0V	0.80V
Output High Voltage (-1.0mA)	5.0V	--
Output Low Voltage (100mA)	--	0.50V

Watchdog

A hardware watchdog is available on the Angelo RTV-24. The watchdog is able to monitor the PC's application operation and will automatically reset the PC after a programmable inactivity time-out. This ensures a reliable operation of remote systems.

Machine Vision Application Solutions

Overview

PC-based machine vision systems are becoming more and more popular due to many factors, including faster Pentium processors, high-speed PCI buses, and more robust operating systems. Today's machine vision applications offer higher productivity, flexibility, reliability, and are capable to perform more complicated inspection tasks. All frame grabber series are FCC and CE certified.
In order to provide a complete solution for machine vision, ADLINK combined hardware and software from Euresys and camera solutions from BASLER and HITACHI to produce a competitive vision package solution.

Typical machine vision applications target static, on-the-fly, and line-scan inspection. The RTV-24 and Picolo families are suitable for static or stage moving color or monochrome object inspection. The Domino family is an ideal analog solution for high-end on-the-fly object inspection, and the GrabLink family can support digital Camera Link camera image acquisition, especially in high-density, high-resolution, and high-accuracy line-scan inspection systems.

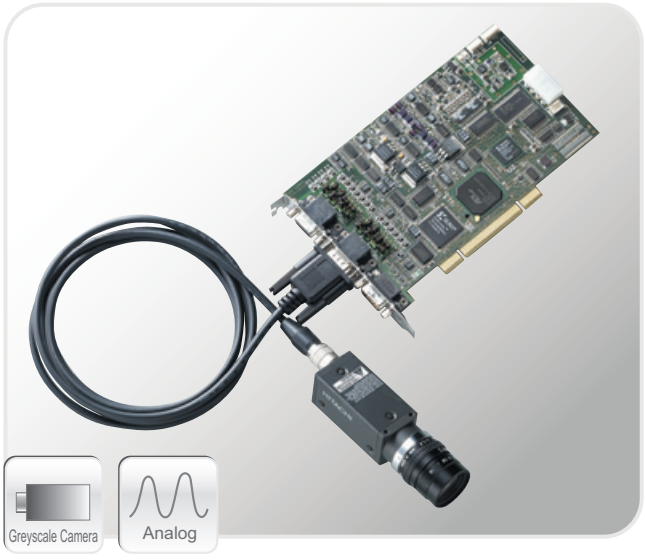
Frame Grabber Selection Guide

Applications	Static inspection				On-the-fly inspection				Line-scan inspection	
Brand	ADLINK	Euresys								
Model No.	RTV-24	Picolo	Picolo Pro2	Picolo Pro3	Domino Iota	Domino Alpha 2	Domino Melody	Domino Harmony	GrabLink Value	GrabLink Expert 2
Signal Type	Analog								Digital	
Standard	Color (PAL/NTSC), Monochrome (CCIR/EIA (RS-170))				CCIR/RS170, Non-standard				Camera Link	
Resolution	640 x 480 (NTSC/RS170), 768 x 576 (PAL/CCIR)				640 x 480 or higher, depending on camera specification				Depending on camera specification	
Interface	32bit, 33 / 66MHz PCI Bus	32bit, 33MHz PCI Bus						64bit, 66MHz PCI Bus	32bit, 33MHz PCI Bus	64bit, 66MHz PCI-X Bus
Max Video Input	4 - 16*	1 - 3	4	4 - 16*	1	2	1	2	1	2
Max Frame Rate	120fps	30fps			12fps - 100fps (depending on camera type)				Depends on camera specification	
Connector interface	BNC x 4	BNC, DB9, S-Video	BNC x 4		HD15 x 1	HD15 x 2	HD15 x 1	HD15 x 2	MDR26 x 1	MDR26 x 2
TTL I/O	Yes									
Area Scan Camera	Yes									
Line Scan Camera	No								Yes	
Monochrome Camera	Yes									
Color Camera	Yes				No			Yes (RGB)	Yes (Bayer, RGB)	
Interlaced Scan	Yes								No	
Progressive Scan	No				Yes					
Camera Tap	Single Tap				Single Tap, Dual Tap			Single Tap, Dual Tap, Triple Tap		
Pixel Resolution	8-bit						10-bit		8-bit - 16-bit	
Max. Clock Frequency	32Mhz						40MHz		Up to 60MHz	Up to 66MHz
On Board memory	No				8MB		16MB	32MB	8MB	16MB
Page No.	3-2	3-7	3-7	3-7	3-8	3-9	3-10	3-11	3-12	3-13

* RTV-E4 four channels extension module optional

Single Progressive CCD Solutions

Domino Iota + Hitachi Camera + 3 Meters Signal Cable



Features

- *Domino Iota: please refer to 'Domino Iota' (page3-9) for full specification details.*
- *Hitachi KP-F3 / KP-F30*
  - *1/3" interline CCD progressive scanning system*
  - *KP-F3: 647(H) x 485(V) resolution and up to 30fps acquisition speed*
  - *KP-F30: 647(H) x 485(V) resolution and up to 60fps acquisition speed*
  - *Spectral characteristic up to infrared region*
  - *A variety of functions including multi-step electric shutter, external HD/VD pulses and field-on-demand*
  - *Bijoux appearance and lightweight*
    Dimensions: 29(W) x 29(H) x 62(D) mm
    Weight: 100g approx
- *3 meters high performance signal cables*

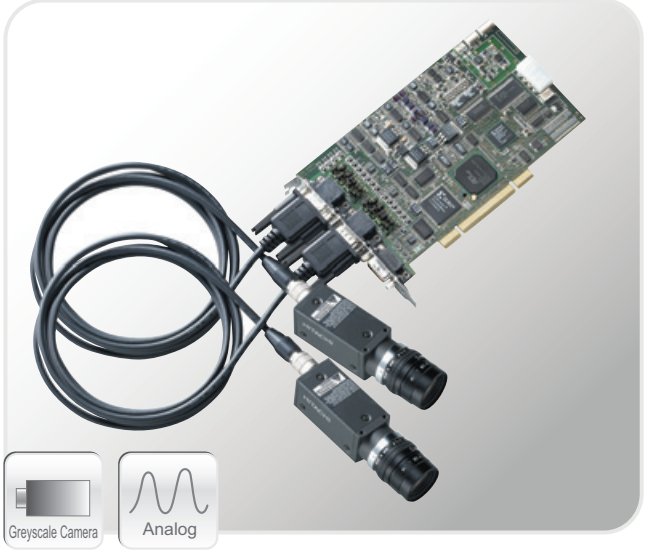
Ordering Information

VP-IF3	Domino Iota + Hitachi KP-F3 + 3M cable
VP-IF30	Domino Iota + Hitachi KP-F30 + 3M cable

*** Call for availability for longer customized signal cables.**
**** Lens are not included.**

Dual Progressive CCD Solutions

Domino Alpha2 + Hitachi Camera + 3 Meters Signal Cable



Features

- *Domino Alpha2: please refer to 'Domino Alpha2' (page3-10) for full specification details.*
- *Hitachi KP-F3 / KP-F30-2S*
  - *1/3" interline CCD progressive scanning system*
  - *KP-F3: 647(H) x 485(V) resolution and up to 30fps acquisition speed via Master mode*
  - *KP-F30-2S: 647(H) x 485(V) resolution and up to 60fps acquisition speed via Pixel Clock mode*
  - *Spectral characteristic up to infrared region*
  - *A variety of functions including multi-step electric shutter, external HD/VD pulses and field-on-demand*
  - *Bijoux appearance and light weight*
    Dimensions: 29(W) x 29(H) x 62(D) mm
    Weight: 100g approx
- *3 meters high performance signal cables*

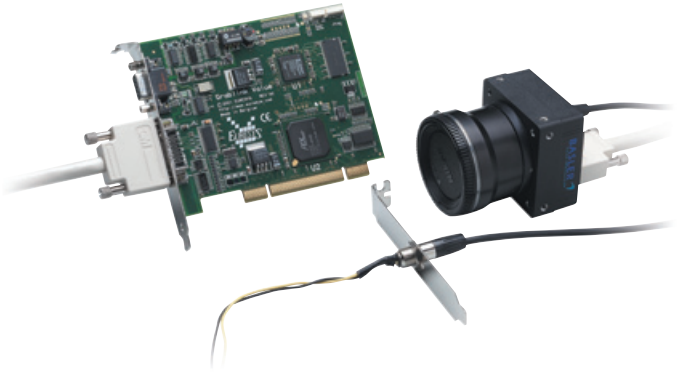
Ordering Information

VP-AF3(2)	Domino Alpha2 + 2pcs KP-F3 + 2pcs 3M cable
VP-AF30CLK	Domino Alpha2 + 2pcs KP-F30-2S + 2pcs 3M cable

*** Call for availability for longer customized signal cables.**
**** Lens are not included.**

Line-scan Solution

GrabLink Value + BASLER Line-scan Camera + 5 Meters Camera Link Cable Kit



RGB Camera | Greyscale Camera | Color Camera | CAMERA Link | Digital

Features

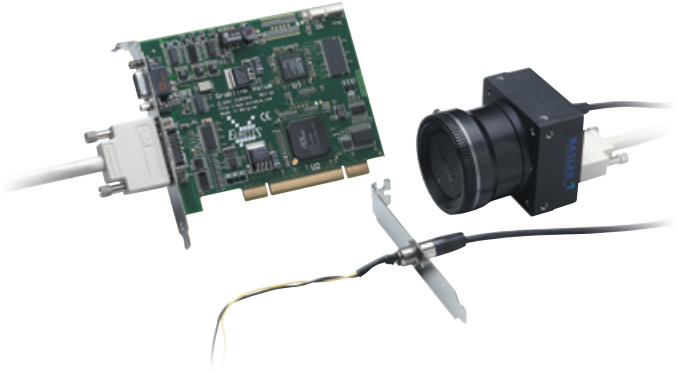
- *GrabLink Value: please refer to 'GrabLink Value' (page3-13) for full specification details.*
- *BASLER L803K Line CCD camera*
  - *8192 pixels resolution with selectable 8- or 10-bit digital output at 20MHz*
  - *High sensitivity: wavelength up to 900nm*
  - *Two electronic exposure control mode*
  - *High signal-to-noise ratio up to 34dB (relative with Gain)*
  - *Programmable exposure time: minimum 1us*
  - *Anti-blooming*
  - *Compact housing manufactured with high planar, parallel and angular precision*
- *5 meters high performance Camera Link cable kit*

Ordering Information

VP-GL803K-8K	GrabLink Value + BASLER L803K + 5M Camera Link cable kit

Area-scan Mega-pixels Solutions

GrabLink Value / Expert 2 + BASLER Mega-pixels Camera + 5 Meters Camera Link Cable kit



RGB Camera | Greyscale Camera | Color Camera | CAMERA Link | Digital

Features

- *GrabLink Expert 2: please refer to 'GrabLink Expert 2' (page3-14) for full specification details.*
- *BASLER A102K/F area CCD camera*
  - *1392 x 1040 resolution and selectable 8- or 10-bit digital output*
  - *Up to 14.8fps acquisition speed*
  - *Area of Interest (AOI) scanning allows higher frame rates*
  - *Electronic exposure time control provides maximum flexibility*
  - *Camera configuration utility*
- *BASLER A501K/F area CMOS camera*
  - *1280 x 1024 resolution and up to 75fps acquisition speed in 8-bit output*
  - *Area of Interest (AOI) scanning allows higher frame rates*
  - *Electronic exposure time control provides maximum flexibility*
  - *Camera configuration utility*
- *5 meters high performance Camera Link cable kit*

Ordering Information

VP-GA102k	GrabLink Value + BASLER A102K/F + 5M Camera Link cable kit
VP-GA501k	GrabLink Expert 2 + BASLER A501K/F + 5M Camera Link cable kit

*** Lens are not included**

FireWire Vision Solution

GEME + BASLER IEEE 1394 Color/Monochrome Area Scan Camera

Introduction

The FireWire Vision Solution -- a combination of all the advantages of the ADLINK GEME embedded system and the BASLER FireWire camera series. This solution is ideal for semiconductor and component inspection, manufacturing quality control, food and beverage inspection, microscopy and medical imaging, intelligent traffic, and biometric applications.

The GEME system has a build-in standard IEEE 1394 connector interface—there is no need for a frame grabber or interface card. The BCAM1394 driver offers a low cost, Plug and Play solution with easy integration by eliminating cabling and interface file creation problems.

GEME-3000

The base embedded system for the FireWire Vision Solution. Please refer to the GEME-3000 section (pages 1-6) for full specification details.

BASLER FireWire Camera Series

Basler FireWire Series cameras are designed for industrial users who require VGA or 1.3 Mega-pixel resolution and high frame rates. With their compact size and the ease of integration associated with their IEEE 1394 interface, A600 cameras are ideal for analog users seeking the advantages of digital video.

The A300 series provides a digital area scan CCD sensor and the A600 series provides a digital area scan CMOS sensor to ensure that these versatile cameras provide an exceptional price / performance ratio.

Model List

Model No.	Resolution(H x V)	Fps	Color/Mono
A301f	658 x 494	80fps	Mono
A311f	659 x 494	70fps	Mono
A311fc	659 x 494	70fps	Color
A312f	782 x 582	50fps	Mono
A312fc	782 x 582	50fps	Color
A601f	656 x 491	60fps	Mono
A601fc	656 x 490	60fps	Color
A602f	656 x 491	100fps	Mono
A602fc	656 x 490	100fps	Color
A601f-HDR	656 x 491	53*fps	Mono
A622f	1280 x 1024	24fps	Mono
A102f	1392 x 1040	15fps	Mono
A102fc	1388 x 1038	15fps	Color

BCAM 1394 Driver/SDK

The BCAM 1394 driver runs under Windows 2000 and Windows XP, and provides viewer program C++ source code for reference.

Features

- *IEEE 1394a standard compliant*
- *Frame grabber NOT needed*
- *On-the-fly inspection*
- *Maximum 2 cameras*
- *Electronic exposure time control*
- *External trigger control*
- *BCAM 1394 driver support*
- *eVision image analysis tool support*

Ordering Information

- *GEME-3000 (memory and storage options available by request)*
- *BASLER Camera Model No.*

Accessories (Optional)

- *BCAM 1394 Driver/SDK*
- *IEEE 1394 Cable (4.5m)*
- *Trigger cable (RJ45 --> Open end, 3m)*

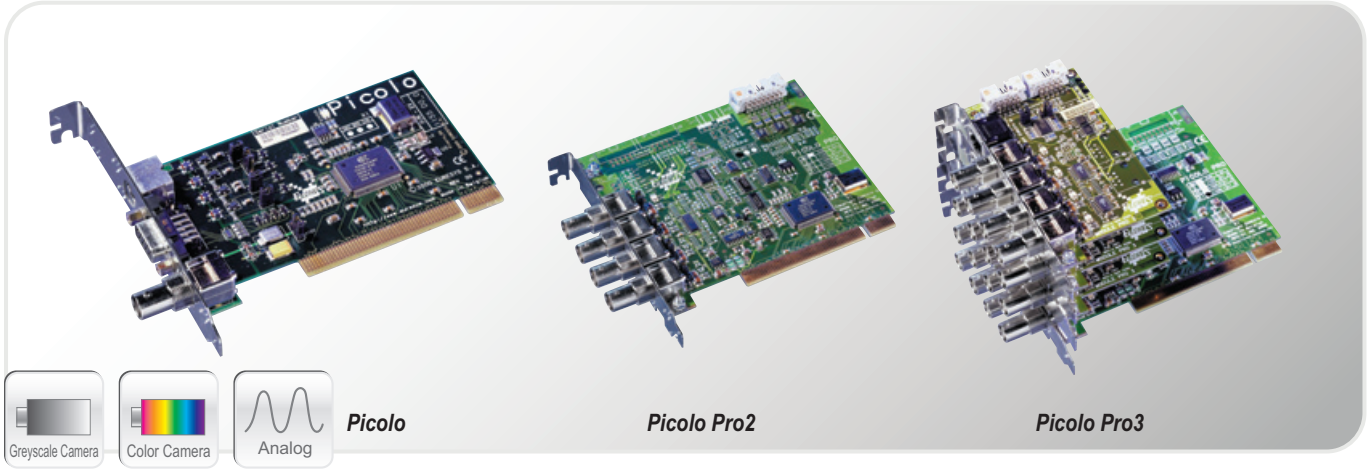
Software Support

eVision Image Analysis Tools

eVision carrier license and dongle required. License ordering information per Euresys standards.

Picolo Series

Color/Monochrome Image Acquisition Cards



Features

Picolo:
- Single channel real-time video capture
- BNC, DB-9, S-Video connectors
- 4 TTL I/O lines

Picolo Pro2:
- Connection of up to 4 cameras
- High frame rate
- 13 TTL I/O lines

Picolo Pro3:
- Modular architecture: 4, 8, 12 or 16 cameras
- High frame rate: 16 new images every second
- Up to 20 digital TTL I/O lines

Physical Information

Picolo	PCI board, 125 x 70mm Power consumption: 1W (200mA@+5V)
Picolo Pro2	PCI board, 125 x 107mm Power consumption: 350mA@+5V, 6mA@+12V, 30mA@-12V
Picolo Pro3	PCI board, 125 x 107mm Power consumption: 1.3W
Extension Module	63 x 107mm Power consumption: 600mW

Ordering Information

Picolo	Ture-color image acquisition card
Picolo Pro2	Supports up to 4 cameras with 4 BNC connectors.
Picolo Pro3	Picolo Pro3 baseboard, supports up to 4 cameras with 4 BNC connectors
Picolo Pro3 Module	Picolo Pro3 extension module, supports up to 4 cameras with BNC connectors

Introduction

General

Picolo: *The Picolo is a low-cost frame grabber card ideal single camera applications. It provides a robust BNC connector, an S-video connector and a DB-9 connector for video input and I/O connections.*

Picolo Pro2: *The Picolo Pro2 is a cost effective frame grabber card optimized for video surveillance applications. The synchronization stage, PCI management hardware and the MultiCam driver have been optimized to allow high-speed acquisition of full-resolution images from multiple unsynchronized cameras. The Picolo Pro2 provides 4 BNC connectors (video input) allowing connection of up to four cameras.*

Picolo Pro3: *The Picolo Pro3 is able to acquire images from up to 16 cameras due to its modular architectural design. The Picolo Pro3 baseboard and each extension module (up to 3) provide 4 BNC and a CTL connector (with 5 TTL I/O lines).*

Image Acquisition

Color Image: *Color video format is compatible with the following composite video input formats: NTSC-M, NTSC-Japan, PCL-B, PAL-D, PAL-G, PAL-H, PAL-I, PAM-M, PAL-N and SECAM.*

Monochrome Image: *The monochrome video acquisition is compatible with CCIR and EIA (RS-170).*

Optional Scaling: *The acquire images or portions of images can be optionally scaled:*
- *Acquisition of a programmable area of interest*
- *Scaling of the image (down to 1:16)*
- *Adjustment of hue (for NTSC signals), contrast (0 to 200%), brightness and saturation (0 to 200% for U and V signals)*
- *Automatic chrominance gain control*

Multiple Cameras

The Picolo Pro2 and Picolo Pro3 can acquire images from unsynchronized cameras within very short switching times. The switching time is < 33ms for NTSC and <40ms for PAL, therefore a total of 16 images can be acquired per second (typical).

Image Transfer

The Picolo series supports PCI bus mastering. Images are transferred to the PC memory using DMA (Direct Memory Access) in parallel with the acquisition and processing. Several Picolo series boards can be simultaneously be in operation within a single PC is supported.

Watchdog

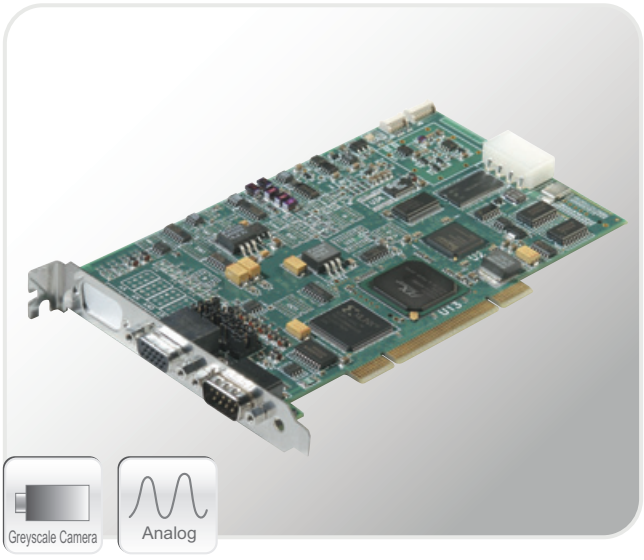
A hardware watchdog is available on the Picolo Pro3I. The watchdog is able to monitor the PC's application operation and will automatically reset the PC after a programmable inactivity time-out. This ensures a reliable operation of remote systems.

Bitmap Image Formats

Before storing the acquired images to its located memory buffer, a pixel format conversion takes place in real-time. Numerous color or monochrome formats can be chosen: RGB32, RGB24, RGB16, RGB15, Y8, YCrCb 4:2:2, YCrCb 4:1:1, Planar YCrCb 4:2:2, Planar YCrCb 4:1:1

Domino Iota

Image Acquisition from a Monochrome Analog Camera



Features

- *Supports progressive or interlaced single-tap cameras*
- *8-bit 32MHz A/D converter*
- *High-resolution, typically 1300 x 1030*
- *Multi-mode synchronization system, including pixel clock and PLL locking*
- *Asynchronous reset, shutter control, strobe control*
- *8-Mbyte frame buffer*
- *Real-time look-up tables*

Software Support

The MultiCam driver enables control of several Domino and GrabLink frame grabbers simultaneously, using an arbitrary number of cameras. MultiCam allows defined channel linking cameras to be buffered into the PC memory. The MultiCam channel identifies all parameters ruling the acquisition process for a camera. All camera features, such as resolution and control means, are reported through simple parameters. The MultiCam driver runs under Windows 98SE/ME/NT/2000/XP.

Ordering Information

Domino Iota	Image acquisition from a monochrome analog camera

Introduction

General

The Domino Iota is an entry-level frame grabber for single-tap monochrome analog cameras. This new Domino card is an ideal solution for cost-sensitive applications.

The Domino Iota supports most system associated with industrial acquisition, with functions such as asynchronous reset, exposure and strobe control. TTL I/O lines are also provided for ease of system integration.

The Domino Iota comes with a MultiCam driver, which provides a comprehensive list of specific cameras and system features. MultiCam exposes a drivers API (Application Programming Interface) allowing it to define a uniform acquisition control layer for all EureSys' frame grabbers. The Domino Iota and MultiCam are compatible with eVision, an image analytical library for EureSys, offering an extended set of functions optimized for machine vision applications.

Acquisition

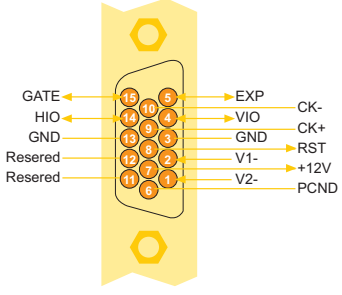
The Domino Iota is equipped with an 8-bit A/D converter and can have a sampling rate of up to 32MHz. The Domino Iota has two 8-bit input look-up tables and a programmable input filter (20, 10 or 5MHz). Gain control and offset are programmable.

PCI Interface

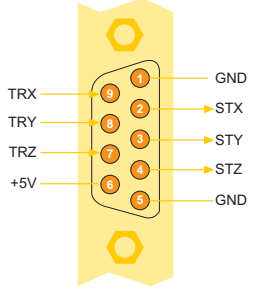
The Domino Iota is a 32-bit, 33MHz PCI bus frame grabber with 3V or 5V signaling. DMA and bus mastering are supported.

Camera and I/O Connectors

HD15 Connector: *The HD15 connector is compliant with the EureSys-defined analog camera connector and includes camera powering.*



HD15 Connector



DB9 Connector

DB9 Connector: *The DB9 connector manages trigger and strobe functions and general purpose I/O. The connector is identical to the Domino Alpha and Gamma model.*

Camera Support

The Domino Iota accepts any kind of single tap camera with progressive or interlaced scanning, synchronous or asynchronous reset, and with shutter and strobe control.

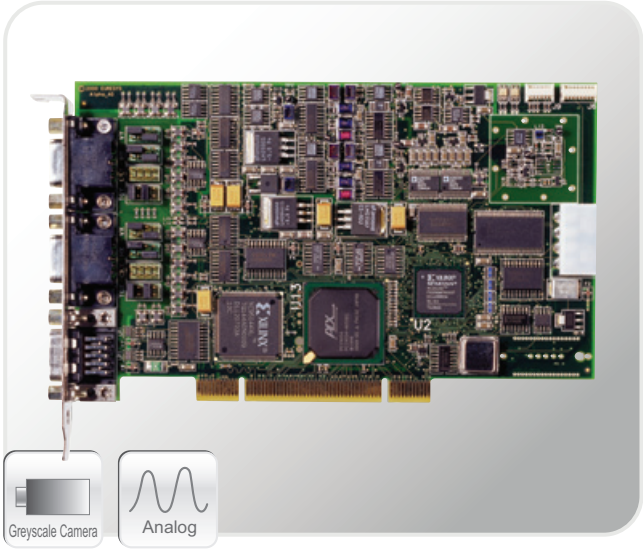
With the high-resolution capability of the board, it is compatible with many state-of-art analog cameras typically up to 1300 x 1030 resolutions. A Multi-mode synchronization system is available. It includes the pixel clock and PLL locking.

On-board Memory

The Domino Iota benefits from a 8MB on-board frame buffer.

Domino Alpha2

Advanced Monochrome Industrial Image Grabber Card



Features

- 32-bit, PCI bus image grabber card
- Industrial frame grabber compatible with monochrome analog cameras (single or dual-tap)
- Two 8-bit 32MHz A/D converters
- High-resolution, typically 1300 x 1030
- Independent camera control: 2 timing generators, 2 trigger & strobe lines
- Asynchronous reset, shutter control and progressive-scan support
- 8 MB frame buffer
- Libraries, ActiveX controls and DLLs included

Applications

- Quality control
- Semi conductor inspection
- On-the-fly image acquisition
- High frame rate image acquisition

Software Support

DLLs and ActiveX controls for windows NT/95/98/2000

Ordering Information

Domino Alpha2	Advanced monochrome industrial image grabbers card

Introduction

General

*The Domino Alpha2 is a flexible industrial frame grabber card compatible with monochrome analog cameras. It is the ideal solution for **on-the-fly** applications.*

*The Domino Alpha2 provides acquisition from **two single-tap** or **one dual-tap** analog cameras on a single PCI board. The Domino Alpha2 is fitted with **2 camera connectors** and two digitizers. Simultaneous acquisition from both channels is possible. Two timing generators, two trigger and strobe lines are available for independent camera control.*

*The Domino Alpha2 supports standard as well as top-notch high-resolution cameras with a pixel clock frequency up to **32MHz.** Asynchronous reset, exposure control and progressive scanning are supported. It comes with the **MultiCam** driver, which drastically simplifies its integration into your machine vision application.*

Specifications

Acquisition

- Two **8-bit 32MHz** A/D converters
- Two 8-bit input **look-up-tables**
- 20, 10 or 5MHz programmable input filter
- Programmable **gain and offset** control PCI Interface

PCI Interface

- PCI rev 2.2 compliant interface
- Support of DMA and bus mastering

Camera Support

- Support of **single-tap** and **dual-tap** analog cameras
- Support of high-resolution cameras, typically up to **1300 x 1030 pixels**
- **Interlaced** or **progressive** scanning
- Asynchronous reset and shutter control
- Camera **pixel clock** support
- Typical configurations supported
  - Two independent **single-tap** cameras
  - One **dual-tap** camera

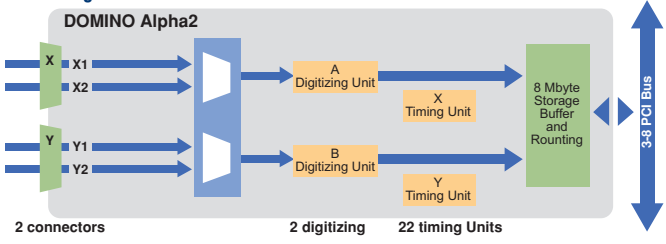
Timing Generators

- Two independent timing generators
- The timing generator X supports analog and digital synchronization
- The timing generator Y only supports digital synchronization
- A digital synchronization requires H, V and pixel clock signals from the camera while an analog synchronization only uses the video signal

Frame Buffer

- 8 Mbyte SDRAM frame buffer

Block Diagram



Connections

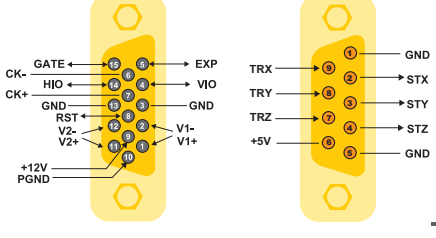
Camera Connection

Two DB15HD connectors on the main bracket including:

- Differential / single ended video inputs (75 ohms)
- Reset, VD, HD, exposure control and pixel clock lines
- Specific connection for 12 V camera supply

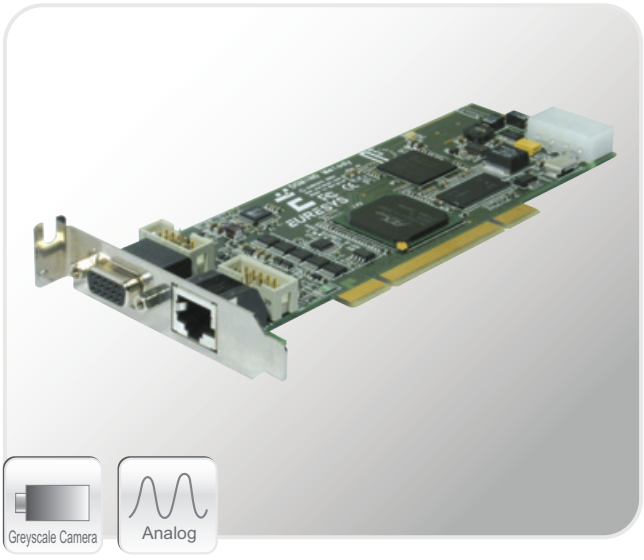
I/O Connections

Trigger-strobe (3 lines each) DB9 connector.



Domino Melody

Single Channel High Quality Progressive Scan Analog Frame Grabber



Features

- **One single-tap monochrome camera**
- **One 10-bit, 40MHz A/D converter**
- **16MB on-board frame buffer**
- **324-bit,33MHz PCI bus**
- **Asynchronous reset support, shutter control, synchronization**
- **Trigger, strobe I/O and two enhanced I/O lines**

Software Support

The MultiCam driver enables the consistent control of several Euresys frame grabbers, using an arbitrary number of cameras, from one or several software applications. MultiCam allows defining channels linking cameras to buffers in the PC memory. The MultiCam channel identifies all parameters ruling the acquisition process from a camera. Every camera feature, such as its type, resolution, or image format is described and controlled through simple parameters. The MultiCam driver runs under Windows 2000, XP, Server 2003 and Linux RedHat 7.3 and RedHat 8.0.

Ordering Information

Domino Melody	Single channel high-quality progressive scan analog frame grabber

Introduction

The Domino Melody is a high-quality and cost-effective acquisition board for industrial monochrome analog cameras. It incorporates D³ Technology to provide perfect digital images. This frame grabber is an ideal solution for mono-camera applications inspecting fast moving objects.*

D³ Technology™

- *Full digital signal processing for analog image acquisition*
  D³ Technology™ performs all the following functions in the digital domain:
  - *Black level restoration*
  - *Synchronization recovery: vertical and horizontal*
  - *Sampling clock generation*
  - *Low-pass filtering*
  - *Gain, offset control*
  - *Color control*
  - *Color sub-carrier removal*
  - *Look-up table, gamma handling*
  - *Control over horizontal and vertical pixel counts*
- *Inherent extra-low jitter*
- *Absolute digital stability and consequently no need of pixel clock*
- *Absolute parametric stability*
- *Analog, master and digital synchronization schemes supported*
- *Excellent performance reproducibility.*

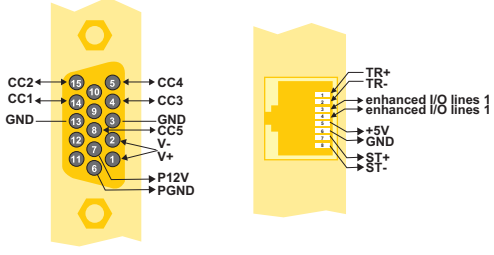
Camera Support

In addition to standard CCIR and RS170 cameras, Domino Melody also supports any kind of area-scan single-tap analog camera including double-speed and mega-pixel cameras. Progressive or interlaced scanning is also supported. Its 75-ohm termination is software selectable.

Camera and I/O Connectors

Bracket connectors:

- *One HD15 video connector*
- *One RJ45 system connector*



Internal connectors:

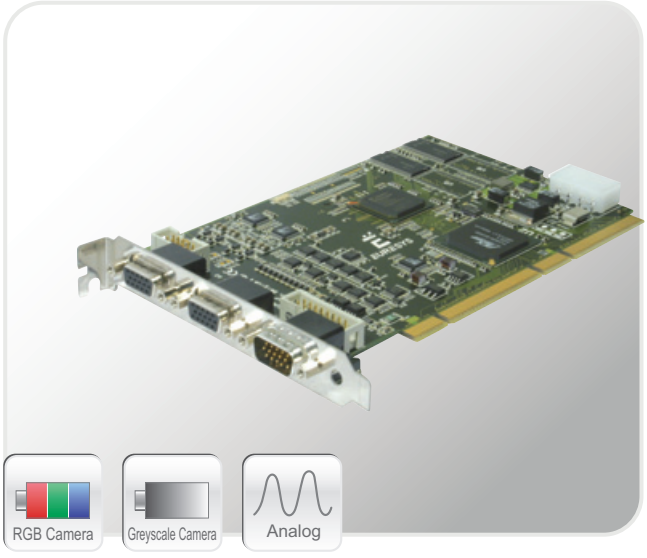
- *One 10-pin header video connector*
- *One 10-pin header system connector*
- *One Molex 4-pin connector for camera power supply*

Trigger, Strobe, Enhanced I/O Lines

- *One opto-isolated output line for safe control of external equipment*
- *One differential input line for high-speed, robust and flexible control from external equipment*
- *Two digital TTL I/O lines for general purpose control*

Domino Harmony

Dual-Channel High Quality Progressive Scan Analog Frame Grabber



Features

- *One RGB or two monochrome cameras*
- *Four 10-bit, 40MHz A/D converters*
- *32MB on-board frame buffer*
- *64-bit, 66MHz PCI bus*
- *Two DMA channels*
- *Trigger, strobe I/O and two enhanced I/O lines*
- *Asynchronous reset support, shutter control, synchronization*

Software Support

The MultiCam driver enables the consistent control of several Euresys frame grabbers using an arbitrary number of cameras, from one or several software applications. MultiCam allows defining channels linking cameras to buffers in the PC memory. The MultiCam channel identifies all parameters ruling the acquisition process from a camera. Every camera feature, such as its type, resolution, or image format is described and controlled through simple parameters. The MultiCam driver runs under Windows 2000, XP, Server 2003 and Linux RedHat 7.3 and RedHat 8.0.

Ordering Information

Domino Harmony	Dual channels high-quality progressive scan analog frame grabber

Introduction

The Domino Harmony is a dual-camera acquisition board for industrial monochrome and RGB analog cameras. It incorporates D³ Technology™ to provide perfect digital images to color applications.

D³ Technology™

- *Full digital signal processing for analog image acquisition*
  D³ Technology™ performs all the following functions in the digital domain:
  - *Black level restoration*
  - *Synchronization recovery: vertical and horizontal*
  - *Sampling clock generation*
  - *Low-pass filtering*
  - *Gain, offset control*
  - *Color control*
  - *Color sub-carrier removal*
  - *Look-up table, gamma handling*
  - *Control over horizontal and vertical pixel counts*
- *Inherent extra-low jitter*
- *Absolute digital stability and consequently no need of pixel clock*
- *Absolute parametric stability*
- *Analog, master and digital synchronization schemes supported*
- *Excellent performance reproducibility.*

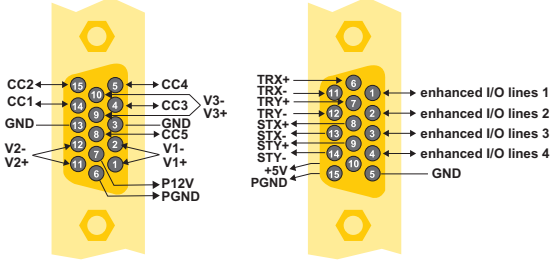
Camera Support

In addition to standard CCIR and RS170 cameras, Domino Harmony also supports any kind of area-scan monochrome or RGB analog camera, including dual-speed and mega-pixel cameras. Another unique feature is that the Domino Harmony needs no jumpers. Its 75-ohm termination is software selectable.

Camera and I/O Connectors

Bracket connectors:

- *Two HD15 video connectors*
- *One HD15 system connector*



Internal connectors:

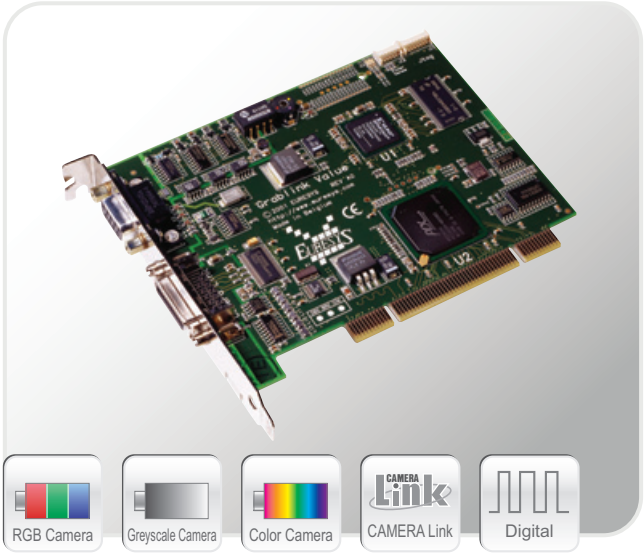
- *One 10-pin header video connector*
- *One 16-pin header system connector*
- *One Molex 4-pin connector for camera power supply*

Trigger, Strobe, Enhanced I/O Lines

- *One opto-isolated output line for safe control of external equipment*
- *One differential input line for high-speed, robust, and flexible control from external equipment*

GrabLink Value

Affordable Image Acquisition from Digital Camera Link Camera



Features

- **Support of one line or area-scan Camera Link camera in base configuration**
  - **single-tap (8 to 16 bits)**
  - **dual-tap (8 to 12 bits)**
  - **RGB (3 x 8 bits)**
- **Acquisition : up to 24 bits @ maximum 66MHz**
- **One DB9 connector for trigger and strobe lines**
- **16-MByte frame buffer**
- **Libraries, ActiveX controls and DLLs included**

Applications

- **Quality control**
- **Semi conductor inspection**
- **On-the-fly image acquisition**
- **High frame rate image acquisition**

Software Support

DLLs and ActiveX controls for windows NT/95/98/ME/2000

Ordering Information

GrabLink Value	Camera Link digital industrial image grabbers card.

Introduction

General

*The EureCard GrabLink Value is an affordable PCI Camera Link frame grabber for **cost-effective** industrial applications. Following the **base configuration** of the standard, Grablink Value acquires images from one Camera Link compliant camera, single-tap (8 to 16 bits), dual-tap (8 to12 bits) or RGB (3 x 8 bits).*

Featured for industrial applications such as inspection of high-speed moving objects, web inspection or high-resolution acquisition, GrabLink Value provides a perfect control of line-scan and area-scan cameras, thanks to its system connector. GrabLink comes with the MultiCam driver, which drastically simplifies its integration into your machine vision application.

Specifications

Acquisition

- *Up to 24 bits @ maximum 66MHz*

PCI Interface

- *PCI rev 2.2 compliant interface*
- *Support of DMA and bus mastering*

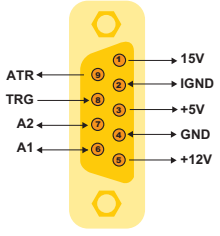
Camera Support

- *Typical configurations supported*
  - *One 8~16 bit monochrome Single-Top Camera*
  - *One 8~12 bit monochrome Dual-Top Camera*
  - *One RGB triple 8bit Camera*
- *Support of high-resolution cameras, typically up to 4096 x 4096 pixels*
- *Area Scan and Line Scan Camera Supported*

Camera Control

*The **EureCard Grablink** Value is fiitted with a **DB9 connector**. This system connector allows to control a line-scan or an area-scan camera. The two lines A1 and A2 are optically isolated. TRG is an input that can be used as a trigger, or as a general purpose input. STR is an output that can be used as a strobe control, or as a general purpose output.*

	Line-scan camers	Area-sacn camers
A1	Trigger for camera line scanning From motion encoder	Frame trigger for camera
A2	Trigger for camera page operation From object position detector	Light strobe output for illumination



Female System Connector DB9

*GrabLink includes **a programmable "rate converter"**. The encoder signal is received through the System connector, and digitally filtered. The rate converter allows you to accommodate the frequency of the encoder pulses. The line acquisition rate may be programmed either higher or lower than the encoder pulse rate, thus allowing you to keep the same encoder for several applications and always get a **perfect square-pixel image**.*

*The **"Scan Mode"** of GrabLink allows to use line-scan cameras in **"Page Mode"** or **"Web Mode"**. In "Page Mode", the page trigger event triggers the acquisition of a given number of lines. The system thus behaves as a 2D acquisition system. The page trigger may be internal (software command) or external (Frame Trigger input). There is a programmable delay between the page trigger event and the actual start of the page. In **"Web Mode"**, the system continuously acquires and transfers lines from the camera, without ever dropping a line.*

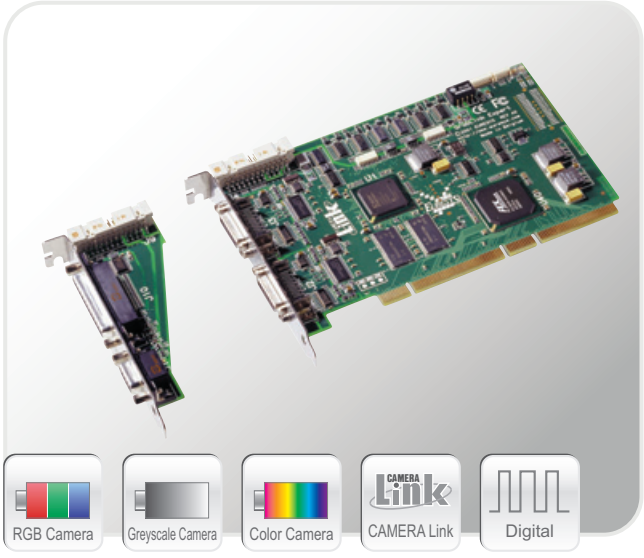
Multi-tap camera byte-reordering and tap reversal supported

Frame Buffer

- *16 Mbyte SDRAM frame buffer*

GrabLink Expert 2

Image Acquisition from Digital Camera Link Cameras



Features

- *Support of line- or area-scan cameras in Base, dual Base or Medium Camera Link configurations*
- *64-bit, 66MHz PCI bus*
- *Acquisition: 24-bit/48-bit at a maximum of 66MHz*
- *16Mbytes on board memory*
- *Asynchronous reset, exposure control and I/O lines (trigger & strobe)*
- *Camera Link serial line configurable as an additional PC COM port*
- *Multiple taps, tap reversal, tap multiplex, dynamic windowing*

Software Support

The MultiCam driver enables control of several Domino and GrabLink frame grabbers simultaneously, using an arbitrary number of cameras. MultiCam allows defined channel linking cameras to be buffered into the PC memory. The MultiCam channel identifies all parameters ruling the acquisition process for a camera. All camera features, such as resolution and control means, are reported through simple parameters. The MultiCam driver runs under Windows 98SE/ME/NT/2000/XP.

Ordering Information

GrabLink Expert 2	Image acquisition from digital Camera Link camera

Introduction

General

The EureCard GrabLink Expert 2 is a high-performance 64-bit, 66MHz PCI bus board capable of acquiring images in 2-Base or one Medium configuration. The GrabLink Expert 2 is a high-speed PCI frame grabbers for line- or area-scan Digital Camera Links.
State-of-the-art cameras are easily connected with off-the-shelf Camera Link compliant cables. The GrabLink Expert 2 is ideal for industrial applications such as inspection of high-speed moving objects, web inspection or high-resolution acquisition.

Configuration Supports

GrabLink Expert 2 is a Camera Link compatible frame grabber fitted with two Camera Link connectors. It's capable of acquiring images simultaneously or independently from two line-scan or area-scan digital cameras in a dual Base configuration. GrabLink Expert 2 also supports one camera in a Medium configuration. It supports various types of cameras:

Number of camera	Mono. single-tap	Mono. dual-tap	RGB triple-tap	Mono. quad-tap	Mono. octal-tap
Base	Two 8-16bits	Two 8-12bits	Two 8bits		
Extend Base *				Two 8-12bits	
Medium			One 10-12bits	One 8-12bits	
Extend Medium *					One 8-12bits

* Multiplex tap. Preliminary feature

Line-scan Systems

Camera Modes: *The EureCard GrabLink series interfaces to state-of-the-art Camera Link line-scan cameras with line-rate and exposure control. Free running cameras are supported as well.*

Continuous Web Scanning: *The "web mode" allows inspection of a continuously moving surface without losing any lines.*

Successive Object Scanning: *In "page mode", GrabLink acquires a set of consecutive lines constituting a 2D image. The acquisition starts when the object enters the cameras field of view, as signaled by an external trigger.*

Motion Encoder: *When the observed web or object moves at a variable speed, the frame grabber imposes a camera scanning rate derived from a motion encoder. This guarantees a fixed pixel aspect ratio. Perfect square pixels are achievable. A built-in rate converter can define any ratio between the camera scanning rate and the encoder pulse rate with a 1/1000 resolution. Thus, an off-the-shelf encoder can be used to serve several applications. The exposure control feature guarantees a constant sensitivity despite the speed variation.*

Serial Control of Cameras

The GrabLink Expert 2 supports two Camera Link pseudo RS-232 serial lines. The application software can use the Camera Links API functions to control the camera. Alternatively, the serial lines can be configured as additional PC COM ports ensuring interoperability with existing camera control software.

I/O Board

GrabLink Expert 2 is delivered with an auxiliary I/O board implementing the trigger and strobe facilities. The bracket is fitted with two connectors. On the female DB9 connector, system components (such as a motion encoder) benefit from isolated I/O lines and power supply. TTL trigger and strobe lines are available on the female DB25 together with 16 fully programmable general-purpose I/O lines.

eVision

Image Analysis Tools

Features

- *Easy to learn and use*
- *Optimized for MMX*
- *Robust, flexible and powerful*
- *Sub-pixel measurement accuracy*
- *Compatible with Windows (2000, XP, XP Embedded and 2003 server) and Linux (RedHat 7.3 and RedHat 8.0)*
- *Compatible with Microsoft Visual Basic, Microsoft VB.NET, Microsoft Visual C++, Borl and C++ Builder and Borland Delphi*

Introduction

eVision forms a unique suite of software tools tailored to industrial machine vision. The eVision tools are suitable for a variety of measurements, character recognition, mark inspection or surface analysis on grayscale and color images. The tools also contain pre-processing functions for image enhancement and noise reduction. Easy to understand, open, and well documented, the eVision tools quickly integrate into any application requiring image processing or analysis. The eVision tools are based on Object Oriented Programming (OOP) concepts. They allow you to develop your application under the most up-to-date programming environments and operating systems. They exploit the power of your Pentium processor and are optimized for MMX technology.

Image

eVision images are the building blocks of an Easy library which are used by all other eVision components.

- *8-bit gray level image*
- *16-bit gray level image*
- *24-bit true color image*
- *15-bit color image*
- *16-bit color image*
- *32-bit color image*

Region of Interest (ROI)

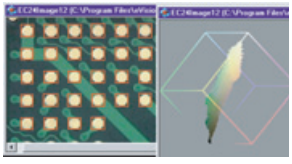
In an eVision image, a Region of Interest is a rectangular zone defined by an origin point, a width and a height.

An image may accommodate several ROIs, which are organized in a hierarchical manner to manage and apply common features or actions (move, delete, etc.) on ROIs.

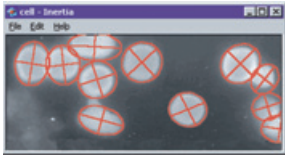
- *8-bit gray level ROI*
- *16-bit gray level ROI*
- *24-bit color ROI*

EasyImage™ *includes gray level and color image processing functions for tasks such as enhancement and restoration by linear or non-linear filtering, geometric transformations for registration, histogram analysis for thresholding. These operations are usually performed as pre-processing steps to improve the image quality and obtain a good contrast between the background and objects of interest.*

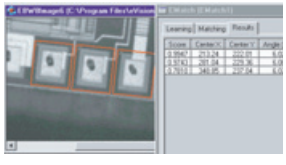
EasyColor™ *includes color-enable functions for color image processing and support for altemate color systems: RGB, XYZ, L*a*b, L*u*v*, YUV, YIQ, ISH, LSH, VSH, LCH and YSH. EasyColor provides efficient means to convert images between these systems and to transform between color and gray level images. This component is complementary to EasyImage.*



EasyObject™ *is used for blob analysis that is obtaining information about distinct objects that are present in an image. Processing is based on connected component labeling, to isolate and identify objects. Various geometric features of the objects, such as the area of ellipse of inertia parameters, are then computed and the objects are sorted and selected with respect to these features. Blob analysis is a convenient way to locate objects even without any prior knowledge of their shape, size and position, to measure these characteristics and discriminate between them.*

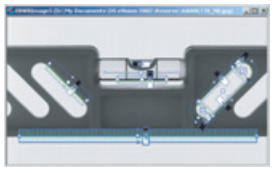


EasyMatch™ *locates templates previously shown to the system and arbitrarily positioned in an image. Patten matching is a convenient and straightforward way to accurately find the location of one or several instances of a known object.*



EasyFind™ *is designed to find one or more occurrences of given pattern in a larger image, featuring fast processing and improved robustness compared to classical algorithms. EasyFind has a high tolerance to pattern degradation due to noise, blur, occlusion, missing parts, or varying illumination conditions. With an adjustable accuracy up to sub-pixel level, EasyFind provides very precise, rotation and scaling invariant, and alignment. It also supports' don't care' areas. This feature allows creating complex pattern shapes. EasyFind is easily integrated into any application, requiring no knowledge of machine version concepts.*

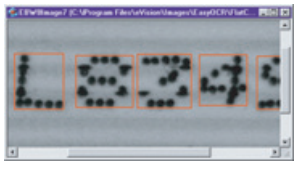
EasyGauge™ *is a second-generation mea-surement and dimension control library for use in gauging applications. By relying on proven sub-pixel edge detection and least squares fitting algorithms, it allows determining the position, orientation, curvature, size, etc. of manufactured parts with an excellent accuracy.*
Robustness is ensured by powerful edge-point selection mechanisms that are intuitive and easy to use, allowing measurement in cluttered images. In addition to these state-of-the-art features, EasyGauge also supports adjustment of parallel sides, thus providing means of means of measuring thickness of flat or bent objects, as well as precise location of corners.



EasyOCV™ *is an optical character verification tool for mark inspection. It provides automatic training of the model adjustable acceptance levels and a robust gray-scale analysis. EasyOCV is suitable for various mark inspection and label printing verification applications, for PCB inspection, for LCD inspection, or for the detection of mixed lots.*

EasyOCV™ *has been designed for on-line verification. It can detect a blurred, misaligned, distorted or double mark, extra or missing link, missing characters or reversed mark as well as contrast problems.*

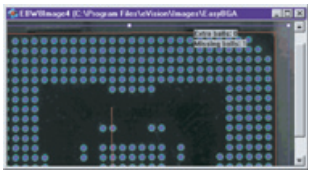
EasyOCR™ *is a font-dependent printed ch-aracter reader based on a template matching algorithm. It allows training on the font to be recognized showing sample images of all possible characters. Hence, it is able to read any kind of short text (serial numbers, labels, etc.) such as those found in industrial environments.*
The training phase uses an interactive utility to show samples of characters and store them in a font file. Such font editor is available and ready-made in EasyAccess. EasyOCR also provides a training phase to recognize text using one of these fonts.



EasyBarCode™ *is a library dedicated to automatically locate and read bar codes. Bar codes encode short character string and are widely used for marking and identifying goods. EasyBarCode is able to identify and read a wide range of standard commonly used symbologies as well as additional symbologies.*
EasyBarCode automatically locates the bar code symbol in the image. For prototyping or special cases, an advanced manual location mode is also available.

EasyMatrixCode™ *is a fully automatic reader of 2D Data Matrix codes. It recognizes a symbol of any size, contrast, location and orientation in a single operation. As an automatic library, a learning phase is not required but is an option. Characteristics of the Matrix Code may be set manually allowing to restrict the search and thus to accelerate the process. Characteristics include: family of the Matrix Code, number of cells, black cells on white background or reverse, flipping allowed or not, etc. Error detection and correction algorithms are used to provide a faithful reading.*

EasyBGA™ *allows you to quickly and easily build a state-of-the-art 2D BGA inspection application. EasyBGA provides BGA model definition and archiving. It is used to count and locate balls with the aim of detecting missing and extra balls. EasyBGA enables high-precision sub-pixel measurement of ball position, pitch, diameter and circularity. High-accuracy is achieved through a precise calibration process: including pixel size and aspect ratio calibration as well as camera rotation and perspective effect compensation. EasyBGA also provides statistical analysis of complete batch of measurement results.*



eVision Starting Kit

The eVision Starting Kit groups the following 5 libraries: EasyMatch; EasyColor EasyObject; EasyImage; EasyGuage; EasyAccess is free and included with any library

Programming Assistant

EasyAccess

For development, you can choose the user-friendliness of Visual Basic or the power of C++. In both cases, EasyAccess, our user interface and code generator will help you to find the image processing function you need and will write the code for you.

License Management

First and Additional Licenses

Every end-user must purchase one license for every library used. After this first license has been purchased, you are entitled to buy additional licenses, at a reduced cost. Please note that all licenses do not include manuals and CDs.

Protection Scheme

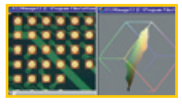
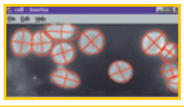
- *eVision licenses are system licenses, i.e. they authorize the execution of the eVision libraries on one PC.*
- *They can be stored either on Euresys frame grabber cards or memory dongle (plugged on the parallel port or USB of the PC).*
- *A dongle is delivered with the eVision Starting Kit. In all other cases, dongles must be purchased separately.*

Ordering Information

Model	Product Name	Description
2171	eVision Starting Kit(*)	Manuals + CD + Memory dongle with 5 basic libraries authority: EasyImage, EasyColor, EasyObject, EasyGauge, EasyMatch
2181	Mark Inspection Kit(*)	Manuals + CD + Memory dongle with 4 Mark inspection libraries authority : EasyOCR, EasyOCV, EasyMatrixCode, EasyBarCode
2166	EasyFind(**)	EasyFind library first license without memory dongle
2165	EasyBGA(**)	EasyBGA library first license without memory dongle
2171-Add	eVision Starting Kit -add(**)	Additional licenses of 5 basic libraries without memory dongle
2181-Add	Mark Inspection Kit - add(**)	Additional licenses of 4 Mark Inspection libraries without
2166-Add	EasyFind - add(**)	memory dongle
2165-Add	EasyBGA - add(**)	Additional license of EasyFind library without memory dongle
512	USB Port Memory Dongle	Additional license of EasyBGA library without memory dongle
513	Compact Parallel Port Memory Dongle	Carrier of eVision licenses Carrier of eVision licenses

(*) 2152-EasyImage, 2160-EasyColor, 2154-EasyObject, 2167-EasyGauge, 2157-EasyMatch, 2155-EasyOCR, 2162-EasyOCV, 2163-EasyMatrixCode, 2168-EasyBarCode can be separated for single or combine orders. Extra Memory dongle can be ordered for combined orders.
(**) EureSys frame grabber or memory dongle is necessary to carry licenses. Systems with EureSys frame grabber or memory dongle carrying specific license codes can only access its corresponding libraries.

eVision Starting Kit

	Key Features
EasyImage	Convolutions and morphology Geometric transformations Image Statistics Image Processing
EasyColor 	Fast conversion to 11 color spaces Color segmentation Color verification Color inspection
EasyObject 	Image segmentation Object labeling Geometric feature extraction Blob analysis
EasyGauge	Edge finding tool Line and circle fitting tools Measurement of sizes, angles and positions Sub-pixel measurement
EasyMatch	Sub-pixel precision Rotation and scaling Don't care area Industrial pattern matching

Mark Inspection Kit

	Key Features
EasyOCR	Teachable system, reliable and robust recognition Pre-defined fonts Optical character recognition
EasyOCV	Comprehensive automatic teaching Accurate built-in calibration Grayscale analysis Optical character verification
EasyMatrixCode	Code rotation and scaling Automatic code detection Error detection and correction Data matrix 2D code reading
EasyBarCode	Product identification Bar code verification automatic symbology identification and detection

eVision Application Libraries

	Key Features
EasyFind	Fiducial alignment Die and wire pounding PCB inspection printing industry Geometric template matching
EasyBGA	Model definition and archiving Missing and Extra ball detection Precise calibration includes Ball position, pitch, diameter and circularity measurement BGA inspection